

Core Areas:

A Framework for Identifying Critical Habitat for Salmon

Presented to:

King County Department of Natural Resources and Parks



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Department of Natural Resources and Parks
Water and Land Resources Division

Science Section

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TABLE OF CONTENTS

Preface

Acknowledgements

Chapter 1: Core Areas: Habitats that Functionally Control the Spatial Structure of Salmon Populations

Chapter 2: The Spatial and Temporal Organization of River Habitats

Chapter 3: Spatial Patterns of Chinook Salmon Spawning in Relation to the Spatial Organization of Riverine Habitats and Core Areas

Chapter 4: Identifying Core Areas for Chinook Salmon

PREFACE

A critical element for salmon conservation planning in King County is the identification and prioritization of management actions and measures that are needed for the recovery and protection of salmon, particularly those populations listed under the federal Endangered Species Act. Fundamental to accomplishing this goal is the delineation of habitats that are critical for maintaining viable salmon populations. Because King County ordinances govern land use and associated activities that can influence or alter a large amount of salmonid-bearing aquatic habitat, the County's conservation strategy is focused on habitat issues. Therefore, King County is working both internally and with the local watershed councils to identify and prioritize habitat protection and restoration actions that are deemed necessary for salmon recovery (e.g., Snohomish Basin Salmon Recovery Forum, Greater Lake Washington Technical Committee). The planning strategy is based on the identification of habitats that are known or suspected to have high use by salmonids for spawning, rearing, adult holding, or refuge from periodic natural or human-caused disturbances. This strategy is consistent with the planning guidance criteria of the National Marine Fisheries Service (NMFS), which recommends that existing highly productive or potentially highly productive areas (sometimes labeled "core areas") should be given a high level of protection¹. The criteria for defining core areas, however, were not provided by NMFS; nor did NMFS define core area functions and how these relate to population survival. Consequently, the approach to identifying critical habitats (i.e., core areas) varies among watershed planning groups, and the technical justification for restoring or protecting specific habitats is not well defined.

The core areas approach for identifying critical areas is conceptually desirable because it helps to focus attention on specific habitats that are considered important for population recovery. However, the effectiveness of the core areas approach in aiding salmon conservation is dependent on how core areas are defined and the criteria used to identify core areas. Current conservation planning documents in King County do not define core areas, even though the concept is generally considered important to the conservation strategy. Because there are varying interpretations and applications of the core area concept for salmon conservation, King County requested the development of a core areas framework that is ecologically sound and can be more consistently implemented. This report addresses their request in four chapters. In Chapter 1, we review the current knowledge and concepts concerning population spatial structure and how spatial structure is formed in salmon populations. Based on our knowledge of structure-forming mechanisms, we propose a conceptual framework to help understand spatial structure at the population/river basin scale. We propose there are certain habitats (i.e., core areas) that functionally control population spatial structure, and we describe the key criteria necessary to identify core areas. In Chapter 2 we identify and describe the

¹ National Oceanic and Atmospheric Administration. 1996. Coastal salmon conservation: working guidance for comprehensive salmon restoration initiatives on the Pacific coast. National Marine Fisheries Service, Portland.

landscape sources and mechanisms that underlie the non-uniform distribution of habitat patches in river. We explore how differences in river morphology (e.g., size and separation distance of habitat patches) scale with size of river and vary within and across watersheds. We also discuss the role of watershed disturbances (i.e., fires, storms, floods, erosion) in contributing to the non-uniform distribution of riverine habitats. Given this framework, we make predictions in Chapter 3 about the spatial organization of riverine habitats and we compare these predictions to the actual distribution of spawning habitats for Chinook salmon in the Skykomish, Snoqualmie, Cedar, and Green rivers. We use existing redd survey data to examine the spatial distribution and characteristics of spawning patches, and based on these findings we identify the characteristics and probable locations of Chinook salmon core areas for spawning in the four study rivers. In Chapter 4, we describe an approach for identifying core areas in rivers that relies on the identification of significant habitat-forming features (Chapter 2) and the delineation of specific habitats that function as core areas based on the core areas criteria (Chapter 1).

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